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Ne.	Feet.
15. Sandstone, steel grey,	12
16. " in thin layers of variegated colors,	5
17. " steel grey, in layers (contains streaks of coarser yellow in layers),	35
18. Shale, Brown,	2
19. Sandstone, Yellow,	6
20. Shale, Brown,	1
21. Sandstone, Steel grey,	40
22. " White,	6
23. Sandstone, Grey,	4
24. Shale, earthy, Black,	1
25. Gypseous earth, Yellow,	.5
26. Shale, Black,	.5
27. Sandstone, contains shells in fragments,	15
28. Shale, Brown,	1
29. Clay, marly,	1.5
30. Sandstone, Yellow,	30
31. Shales and clays, earthy,	25
32. Shale, Brown,	6
33. Sandstone and Gypseous earth,	20
34. Shale, Bituminous,	1
35. Gypseous earth,	3
36. Sandstone, yellow,	10
37. " white,	8
38. Marl, contains shells,	6
39. Gypseous earth,	2
To end of Cut, Shale, clay, and arenaceous Gypseous earth,	60
Length of cut, 440 feet.	

A PRELIMINARY LIST OF FOSSILS, COLLECTED BY DR. HAYDEN IN COLORADO, NEW MEXICO AND CALIFORNIA, WITH BRIEF DESCRIPTIONS OF A FEW OF THE NEW SPECIES.

BY F. B. MEEK.

Read before the American Philosophical Society, May 6, 1870.

SILURIAN SPECIES.

Camp Creek Cañon, Colorado City.

1. *Orthis Coloradoensis*, Meek.

A small, compressed, nearly equivalve, subsemicircular species, much widest on the hinge line, which is sometimes abruptly produced into lateral auricles. Dorsal valve less convex than the other, and having a shallow, rather wide, mesial sinus, rapidly narrowing to the beak, which does not project beyond the hinge line. Ventral valve depressed convex, with cardinal area rather low, flat, inclined backward, and sharply defined to

the lateral extremities; beak not incurved. Surface of both valves ornamented with sharply defined, slightly curved, unequal radiating plications, and finer unequal striæ, which, on the central regions of the valves, are more or less gathered into five or six fascicles, the middle one of which corresponds to the sinus in the other valve.

In its surface markings and sinuous dorsal valve, this species is much like a form from the upper Lingula-flags of Wales, referred by Mr. Davidson, doubtfully, to *O. lenticularis*, Wahlenberg. It is much more extended on the hinge line, however, and has the radiating costæ and striæ more strongly defined on the central region, and more nearly obsolete on each side. From its affinities, it seems to be a Lower Silurian species, but as no other fossils were found with it, its exact age may be somewhat doubtful. It is unlike any Devonian or Carboniferous form known to me.

Crater's Falls.

2. *Merista?* (undetermined).

3. *Ophileta complanata*, Vanuxem, or a very closely allied species.

4. *Bucanella nana*, Meek.

Very small, and much like *Bucania trilobatus*, Hall, but much smaller, with proportionally larger umbilicus, and its three or four volutions increasing less rapidly in breadth, both transversely and in the direction of the plane of the shell; while its middle lobe is proportionally narrower, and embraced by each succeeding turn.

As these little shells want the remarkable expansion of the aperture characterising *Bucania*, and show no traces of the mesial dorsal band, corresponding to a dorsal sinus in the lip; as in *Bellerophon*, they seem to me to belong to an undescribed genus, for which I would propose the name *Bucanella*.

5. *Pleurotomaria?* or *Raphistoma*. Merely indeterminable lenticular casts.

6. *Endoceras*. Small undt. sp.

CARBONIFEROUS SPECIES.

Moleen Station.

1. *Fusulina cylindrica*, Fischer?

2. *Syringopora* (undetermined).

3. *Campophyllum*, like *C. torquium*, Owen, sp. From the Upper Coal Measure, along the Missouri, at Rock Bluff, and near there in Nebraska and Iowa.

4. *Chaetetes* (undt. massive sp.).

5. *Productus Nebrascensis*, Owen.

6. *Spirifer* (*Martinia*) like *S. planoconvexus*, Shumard.

7. *Bellerophon?*; a rude cast; may be a *Nautilus* or *Goniatite*, as it is not in a condition to show septa, if any exist.

Sangre de Christo Pass, South Colorado.

8. *Productus semireticulatus*, Mart. (sp.)

9. *Productus punctatus*, Martin, sp.

10. *Athyris subtilita*, Hall (sp.).

Pecos Church, New Mexico.

11. Fragments crinoid columns.
12. " *Spiriferina*.
13. *Spirifer cameratus*, Morton (fragments).
14. *Productus*. Fragments, like *P. semireticulatus*.

Near Pecos R. N. M., Aug. 6, 1869.

15. *Fenestella* and *Polypora*. Fragments.
16. *Athyris subtilita*, Hall?
17. *Aviculopecten* (undt).
18. *Aviculopecten occidentalis*, Shumard.
19. *Aviculopecten carbonarius*, Stevens?
20. *Myalina Swallowi*, McChesney.
21. *Myalina subquadrata*, Shumard.
22. *Myalina perattenuata*, M. & H.
23. *Pleurophorus*? (undetermined).

Ten miles South of Kosylowiski, New Mexico.

24. *Fenestella* (undt).
25. *Athyris subtilita*, Hall.
26. *Spiriferina Kentuckensis*, Shumard.
27. *Myalina Swallowi*, McChesney.
28. *Myalina* (undetermined).
29. *Avicula* (fragments).
30. *Pleurophorus angulatus*, M. & W.
31. *Pleurotomaria*? (large cast).

Mora Creek, New Mexico.

32. Crinoid columns.
33. *Productus nodosus*, Newberry.
34. *Athyris subtilita*, Hall, sp.
35. *Spiriferina Kentuckensis*, Shumard.
36. *Spirifer Rocky-montana*, Marcou.
37. *Spirifer cameratus*, Morton.

Mora River, (1st ser. Carb.)

33. *Polypora*, *Fenestella*, &c.
39. *Synocladia* (*Septopora*) *Cestriensis*, Prout, sp. (= *S. biserialis*, Swallow.)
40. *Productus semireticulatus*, Mart. (may be, in part, var. of *P. costatus*),
41. *Productus nodosus*, Newb.
42. *Athyris subtilita*, Hall (sp).
43. *Spiriferina Kentuckensis*, Shumard.
44. *Spirifer cameratus*, Morton.
45. *Orthoceras* (fragment).

Hot Springs, Salinas Creek, (Sept. 3d).

46. *Campophyllum*?
47. Crinoid columns.
48. *Chætetes*, undetermined; both massive and ramose.
49. *Productus longispinus*, Sow. (var. *Wabashensis*, N. & P.)
50. *Productus nodosus*, Newb.

Santa Fe, New Mexico.

51. *Hemipronites crassus*, M. & H.
52. *Productus longispinus*, Sow.
53. *Productus semireticulatus*, Martin, sp.
54. *Productus nodosus*, Newb.
55. *Productus*, (undetermined, 2 or more sp.)
56. *Productus Nebrascensis*, Owen.
57. *Orthis* (undetermined).
58. *Chonetes* (undetermined).
59. *Athyris subtilita*, Hall (sp).
60. *Spirifer cameratus*, Morton.
61. *Spirifer Rocky-montana*, Marcou.
62. *Spiriferina Kentuckensis*, Shumard.

Morav. City, Weber Mt.

63. *Productus semireticulatus*, Martin, sp.

Salt Lake.

64. *Campophyllum*. Mere fragments in hard, bluish-gray limestone.

NOTE.—It is worthy of note that, although some of the species mentioned in the foregoing list of Carboniferous fossils, are forms known to be common to the Lower Carboniferous and the Coal Measures of the Western States, they are *all*, with one or two exceptions, so far as they have been identified, forms common in the Coal-measures of Illinois, Iowa, Kansas and Nebraska; while *not a single one of them* is identical with any of the species *peculiar* to the Carboniferous limestone series below the horizon of the Millstone-grit in the Western States, though about 14 of them seem to be peculiar to the Coal-measures there.

JURASSIC SPECIES.

Salinas Creek.—Hot Springs.

1. *Cardinia?* (undetermined).) Very poor specimens, not showing hinge.
2. *Pholadomya* (undt).) Look like some Jurassic forms, but only referred provisionally to that epoch.

Between Sacramento and Summit Station.

3. Undt. bivalve.
4. “ univalves, 2 forms.
5. *Ammonites Nevadensis*, Gabb.

These fragments belong to the group of discoid Liassic species, with keeled and bisulcated periphery, and numerous very slender whorls, all exposed on each side, and crossed by nearly or quite straight, simple, smooth, regularly arranged costæ. They belong to one or the other of Mr. Hyatt's genera—*Discoceras*, *Arnioceras*, or *Ophioceras*. Very probably of Liassic age.

Weber Cañon.

6. *Bivalves*. Mere undeterminable casts, in a matrix like that of beds in the west, of Jurassic age.

Camo. (C. L. Morcham.)

7. *Belemnites densus*, M. & H.

CRETACEOUS SPECIES.

Fountain Creek, Colorado City, Colorado.

- | | |
|---|-------------|
| 1. <i>Inoceramus</i> (undt. sp.) | Cret. No. 4 |
| 2. <i>Baculites compressus</i> , Say. | " |
| 3. <i>Baculites ovatus</i> , Say. | " |
| 4. <i>Scaphites Cheyennensis</i> , Owen. | " |
| 5. <i>Scaphites nodosus</i> , Owen. | " |
| 6. <i>Scaphites Conradi</i> , Morton. ¹ | " 5 |
| 7. <i>Ammonites placenta</i> , De Kay. ² | " 4 |
| 8. <i>Inoceramus problematicus</i> , Schlot. (sp.) | " 3 |
| 9. <i>Ostrea congesta</i> , Conrad. | " |
| 10. <i>Inoceramus</i> (undt. large gibbous distorted sp.) | " |
| 11. <i>Ammonites</i> (undt.) | " 2 or 3 |

Miser Station, U. P. R. R., Oct. 19th.

- | | |
|------------------------------------|--------------|
| 12. <i>Inoceramus</i> (undt.) | Cret. No. 4. |
| 13. <i>Baculites ovatus</i> , Say. | " |

Near Canon City.

- | | |
|------------------------------------|-------------|
| 14. <i>Bivalve</i> (undt. sp.) | Cret. No. 4 |
| 15. <i>Baculites ovatus</i> , Say. | " |

Medicine Bow Station.

- | | |
|-------------------------------|-----------------------|
| 16. <i>Inoceramus</i> (undt.) | Large sp. No. 4 Cret. |
|-------------------------------|-----------------------|

Mission Station, N. P. R. R.

- | | |
|-----------------------------------|--------------|
| 17. <i>Inoceramus</i> (undt. sp.) | Cret. No. 4. |
| 18. <i>Ammonites</i> (undt.) | |
| 19. <i>Caprina</i> (undt.) | |

Between Denver and Cheyenne.

- | | |
|---|--|
| 20. <i>Inoceramus</i> (large undt. sp.) | |
|---|--|

Six miles east of Como Station, U. P. R. R.

- | | |
|-----------------------------------|--|
| 21. <i>Inoceramus</i> (undt. sp.) | |
|-----------------------------------|--|

Valley of Fountain Creek, Colorado.

- | | |
|----------------------------------|-------------|
| 22. <i>Anisomyon</i> (undt. sp.) | No. 4 Cret. |
|----------------------------------|-------------|

Red. Between Hard Scrabble and St. Charles.

- | | |
|---|-------------|
| 23. <i>Inoceramus problematicus</i> , Schlot. (sp.) | Cret No. 3. |
| 24. <i>Ostrea congesta</i> , Conrad. | " " |

Medicine Bow River.

- | | |
|---|--------------|
| 25. <i>Inoceramus fragilis</i> , Hall and Meek. | No. 2 Cret. |
| 26. <i>Scaphites Warrenana</i> , M. & W. | " " |
| 27. <i>Ammonites serrato-carinatus</i> , Meek. | Cret. No. 2. |

Shell attaining a rather large size; discoid, with periphery provided with a very narrow, prominent, serrated mesial keel, including the siphuncle. Volutions increasing rather gradually in size, somewhat com-

¹ I propose for the group of *Scaphites*, of which this may be regarded as the type, the sub-generic name, *Discoscaphites*.

² This may be regarded as the type of a group, for which I propose the name *Placentoceras*.

pressed laterally, and a little excavated, without being distinctly channeled on each side of the ventral keel; inner ones but slightly embraced by each succeeding turn, and consequently well exposed in the wide umbilicus. Surface ornamented with numerous unequal costæ, some of the larger of which bear a small, somewhat pinched node near the umbilicus, and two closely approximated small nodes around the ventro-lateral margins, where they all curve very strongly forward as they pass upon the periphery; spaces between each two of the large nodose costæ, occupied by from one to about three smaller ones. Septa unknown.

Although undoubtedly a Cretaceous species, this shell would rather nearly resemble *A. spinulatus*, Brug., from the Lias, as illustrated by d'Orbigny, if that species had from one to three smaller costæ between each two of its ribs, and its serrated keel more prominent. Our shell also differs in the presence of a small node near the umbilicus, on each of the larger costæ. It is not a true *Ammonite*, according to the latest classification of the *Ammonitidæ*.

Fort Bascom.

28. *Gryphæa navia*, Conrad. Cret. No. 2 or 3.

Dodson's Rancho.

29. *Inoceramus problematicus*, Schloth. (sp.) Cret. No. 2.

30. *Cucullæa*, and other undt. bivalves. " "

31. *Anchura*, undt. " "

Como—(C. L. Morchom).

32. *Baculites ovatus*, Say.

Near Coalville, in high hill, and near base of same.

33. *Ostrea* (undt. sp.)

34. *Modiola Pedernalis*, Rœmn.

35. *Nuculana*.

36. *Pleurotomaria* ? ?

TERTIARY SPECIES.

Associated with Coal-bed, Bear River City.

1. *Ostrea soleniscus*, Meek.

Attaining a length of near one foot, and very narrow, or not more than from one to two inches in breadth; almost perfectly straight, excepting the immediate beaks, which usually curve a little to the left; sides nearly straight and parallel. Upper valve flat; lower moderately concave, and like a little trough. Surface of both valves without radiating striæ or costæ, or strong concentric markings. May be Cretaceous.

Limestone-hill, Bear River.

2. *Unio vetustus*, Meek.

3. *Unio belliplicatus*, Meek.

Differs from the last in having the posterior dorsal region marked with about six to eight strong, regular, oblique plications, which begin very small and crowded, just in front of the beaks, and radiate backward and downward nearly to the posterior and postero-basal margins.

4. *Corbula (Azara) pyriformis*, Meek.
5. " " " var. *concentrica*, Meek.
6. " " *Engelmanni*, Meek.
7. *Cyrena (Corbicula) Durkeei*, Meek.

Shell attaining a moderately large size ; subtrigonal in outline, thick and strong, gibbous in the central and umbonal regions, and cuneate postero-ventrally ; posterior side sloping above, and narrowly rounded below ; beaks rather elevated, pointed, and curving inward and forward, so as nearly to touch each other ; posterior dorsal region much inflected from the beaks down the slope nearly to the extremity of the valves, so as to give the posterior umbonal slopes a prominently rounded appearance. Surface with moderately distinct marks of growth.

Very closely allied to *C. antiqua*, Ferr., and *C. Forbesi*, Desh., from Lignite Lower Eocene beds of the Paris Basin, but differs from both in the details of the hinge, its lateral teeth being nearly or quite smooth, and like the cardinal teeth, differing in other respects.

Named in honor of Mr. H. R. Durkee, who sent large collections of the species to the Smithsonian Institution, from Wyoming.

8. *Tiara humerosa*, Meek.

Etk Station, Cent. Pac. R. R., beyond Salt Lake.

9. *Sphærium* (two or more species, in highly bituminous shale).

Fort Bridger; Wyoming (McCarter).

Unio Haydeni, Meek.

Melania (Goniobasis?) Simpsoni, Meek.

Viviparus (two or more undt. species).

Planorbis spectabiles, Meek.

Cypris (undt.) In Oolitic ? matrix.

DESCRIPTIONS OF FOSSIL FISHES, FROM THE UPPER COAL MEASURES OF NEBRASKA.

BY ORESTES ST. JOHN.

Read by Dr. F. V. Hayden, before the American Philosophical Society, May 6, 1870.

GENUS CLADODUS, Agassiz.

CLADODUS MORTIFER, N. and W.

Reference.—Newberry and Worthen, Geol. Illinois, Vol. II, p. 22; Pl. I, fig. 5.

In the collection there are fragments of three individuals of the above species—two showing the base with portions of the crown, and one preserving about a third of the lower portion of the median cusp of a very large specimen. There can be no doubt that the teeth before me are referable to the above species; but as they exhibit characters not shown in the imperfect specimen figured and described by Messrs. Newberry and Worthen, a short description of the Nebraska teeth is here appended.